

**AMPEX**

# RA-4000 Automatic Programmer





# RA-4000 Automatic Programmer

Accurate, flexible videotape editing with this automated controller



## features

- Controls up to three pairs of transports — video or audio transports, in any combination.
- Plug-in modules expand control to six transports with simple interface.
- Careful human engineering allows concentration on artistic decision making.
- Unique address for each recorded television frame — allows single frame video inserts.
- Video-only, audio-only, or video with audio can be inserted . . . establishes exact synchronism in multiple transport use.
- Automatic search and cue-up to any desired address.
- Integrates with Ampex disc recorders, switchers, and effects equipment.
- Control panel is designed for quick and accurate decision making.
- Easy to operate pushbutton keyboard provides manual or automatic transport control.
- Electronic address or cue readout with built-in hours, minutes, seconds, frames calculator.
- Full transport function control with rapid access to any point on the tape for true random access.
- Operates at 7½/15 ips, and at all domestic and foreign broadcast standards.
- Expandable external memory available as an accessory.
- Automatic color framing capability.

Ampex introduces automation to videotape editing with its automatic programmer, the RA-4000. The RA-4000 will facilitate the electronic editing, control and precise synchronization of your existing videotape system.

Full- or semi-automatic control of Ampex VR-1200, VR-2000, or the new AVR-1 Series videotape recorders as well as Ampex MM-1000 audio recorders is provided by the RA-4000. Up to three pairs of transports (video or audio) can be controlled simultaneously. Each transport is independent with regard to address, search and cue, and each pair operates in perfect synchronism upon command from the RA-4000. Video-inserts only, audio-inserts only, or combination audio/video-inserts extend production capability. Video-inserts as short as one frame are possible. The RA-4000 operates with any standard or combination of standards simultaneously: 7½ and 15 ips, 25 or 30 frames, audio and video transports, record and playback, and domestic and foreign broadcast standards.

True random access of a videotape recorder is made possible by this new Ampex system which records a unique address to identify each television frame. Readout of the address is in hours, minutes, seconds and frame number. A desired address can be entered by manual keyboard or computer entry, and the videotape recorder will automatically search for the address, stop, cue itself ahead of the address, and wait for a normal roll command. Electronic logic relieves the operator of routine decision making. For large automated systems, control can be via computer, punched tape, or other memory devices.

## ADDRESS CODE

The Ampex RA-4000 Programmer system utilizes a unique address code. Recorded on one of the longitudinal tracks of the transport, the address code provides a complete and individual frame number for each television frame period.

An expandable edit point memory is available as an accessory. This memory is programmed to accept, store, and regenerate information for automatically performing a series of editing sequences on the RA-4000.

The address code is generated by an Ampex time code generator and is recorded in the cue channel of a videotape recorder. However, the address code can be recorded on any audio transport as well.

Providing control of one or more videotape recorders, the RA-4000 allows search, cue, and synchronizing in one automatic sequence. Automatic editing is an inherent benefit of the system. Additional logic provides the memory and control which allows storage of entrance and exit addresses for up to six recorders. Therefore, multiple recorders may be run in absolute address and video synchronism, and electronic splices made at precise, predetermined points.

The system includes many features designed to ease the operator's workload and minimize edit time. An programming sequence may be rehearsed without actually making an electronic edit. The operator may refine his decisions by simple pushbutton movements for changing address codes of decision points. Careful human engineering allows the operator to concentrate on his artistic decision and forget the mechanics.



# New Control Flexibility

The control center for the RA-4000 is a small console containing manual and automatic sequence controls and displays. ed up to 200 feet away is the rack electronics which in turn connects to the transports being controlled. The rack electronics is arranged into a building block concept making it easy to add plug-in modules when more transports are to be controlled.

Any combination of three audio or video transports may be programmed. If desirable, up to three more transports can be controlled in parallel to the first three. Each of these additional transports is separately addressable and they search and cue independently, but each is slaved to one of the three prime transports. The RA-4000 expands easily to work with Ampex HS-200 Disc Recorders, Switchers and special effects generators.

## Control Electronics

Provided with each programmer system are rack mounted control electronics. Included are: System Control Electronics, Transport Control Units, and Power Supply.

The System Control Electronics perform the arithmetic computations for the system. It contains a small, permanently programmed time-share computer which controls mode functions such as dynamic search, dynamic start, preroll, and editor functions.

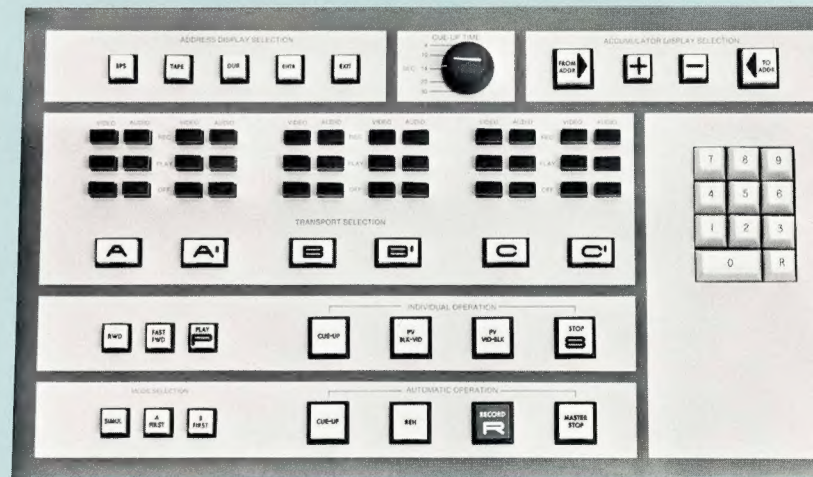
The Transport Control Unit controls one tape transport based upon the arithmetic computations made by the System Control Electronics. A separate Transport Control Unit is needed for each recorder in the system.

## The Console

Three basic system configurations are available for single, double, and triple transport systems. The console, containing control panel and display panel, is supplied with each configuration.

The control panel allows the operator to have full manual control of the recorders for making artistic decisions. Once the decisions are made, the operator has three options: (1) he may perform the electronic splice immediately, (2) he may prepare a log sheet containing the entrance and exit cues for future use in a separate editing session, or (3) the editing information may be stored in a computer so that entire electronic assembly may be executed in a single, continuous operation.

A pictorial display similar to the two basic modes of operation is included in the console. One or the other of these is illuminated from behind, depending upon the mode selected, as an aid to the operator.

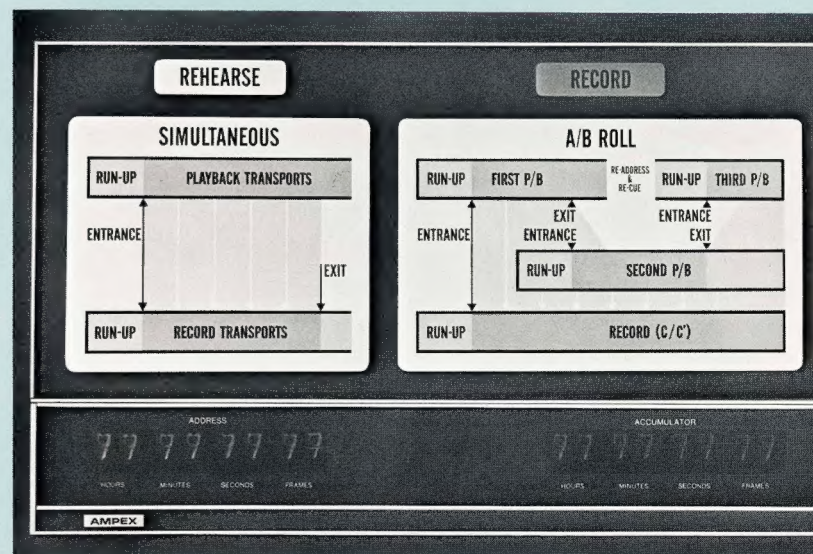


## Operational Modes

Almost all editing functions can be executed by one of two basic modes of operation: Simultaneous Mode, and Sequential Mode.

In the Simultaneous Mode, all controlled transports start together. The outputs of the playback transports are fed to an external video switcher, and then to the record transports.

The Sequential Mode allows A-roll/B-roll techniques to be used. One of the playback transports is not started with the others in this mode. At a nominal ten seconds before the exit point of the playback unit already running, the second playback unit is started. The exit point of the first and the entrance point of the second coincide. Both playback transports are available at this time, and a transition can be made between the two sources. A test is automatically made to determine if the second playback is synchronized with the first and if it is stable. If not, the transports are stopped at the splice point and the actual tape address of each is frozen in a memory. A valid entrance point is thus provided for restarting.





## Accessories

**Address Code Reader** — The Address Code Reader decodes the serialized digital address playback from an audio or cue track and displays it on an 8-digit neon tube display. The basic frame address is read out in hours, minutes, seconds, and frame number. Provision is made for selecting the display of the 8 spare bits and for freezing the display, allowing the operator time to record the numbers on a cue sheet. One address code reader is recommended for each decision maker. This self-contained unit is in a portable case which can be easily rack-mounted with the fold-out hardware provided.



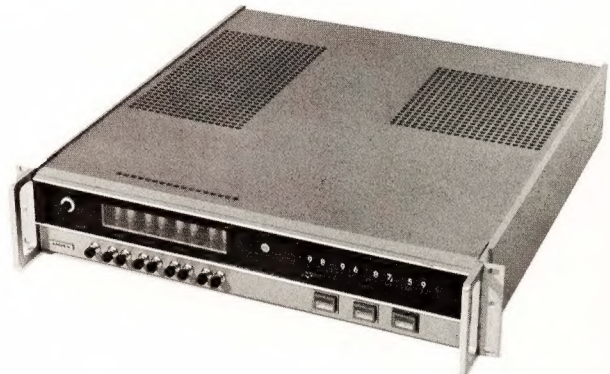
**Interface Kits:** One interface kit is required for each transport controlled by the RA-4000. After installation, the recorder can still be used for all original functions as well as with the RA-4000. Kits are available for VR-1200 and VR-2000 Videotape Recorders and MM-1000 Audio Recorders (none is required for the AVR-1).

**Mark III Editor** — The Mark III Editor is required on any Ampex VR-1200 or VR-2000 functioning as a recorder in the RA-4000

System. When modified with new boards included with the Editor Modification Kit, the Mark III permits recordings to be as short as one frame, whether induced by the RA-4000, by an Editec\* Mark II unit, or manually.

**Monitoring Equipment** — The RA-4000 includes audio and video switching that allows monitoring of the actual programmed sequence on separate monitoring equipment. Examples are the Ampex AA-620 audio power amplifier and speaker system, and the RKA-14 Conrac 14-inch solid-state picture monitor.

**Time Code Generator** — The Time Code Generator is a self-contained unit which produces a unique binary coded address of eight digits for each TV frame as well as a set of 8 spare digits for adding "scene" or "take" identification. Its low impedance (50 ohms) output can be distributed to one or more audio channel record inputs of any videotape or audio tape recorder. A Time Code Generator is required at each recording location and is conveniently packaged with carrying handles for field use or for permanent rack mounting with its swing-out brackets.



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